



Exchange rate variation and Nigeria's balance of trade

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General Note



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ABSTRACT

This work evaluated the relationship between exchange rate variation and Nigeria balance of trade between 1988 and 2018. This study was necessitated by the fact that balance of trade is directly or indirectly affected by the direction of exchange rate in the country. Specifically, the study evaluated the nature and extent of the relationship between exchange rate and balance of trade, the dynamic characteristics of exchange rate and trade imports and ascertains the effect exchange rate on trade export. The method of data collection was through secondary data. The data collected were regressed by simple regression model and analyzed by ordinary least square (OLS) analytical method. Findings based on analysis showed that there is a significant relationship between exchange rate and balance of trade. The study recommends export of primary products so as to attract foreign exchange inflows and foreign investment while the economy should be geared towards production of multi-sectored tradable goods for foreign exchange.

Keywords: Exchange Rate, Variation, Balance of Trade

1. INTRODUCTION

The foreign exchange reforms geared towards cumulative depreciation have continued attempting to achieve the goal of healthy balance of trade and the maintenance of a stable exchange rate. The depreciation of the naira was expected to result in an overall

increase in the production for exports which leads to favorable balance of trade (Ojo, 2010). Sanusi (2004) stated that the volatility and continued depreciation of the exchange rate of the naira is caused by the expansionary liquidity and the resultant persistent excess liquidity in the banking system. Exchange rate depreciation had on many occasions been adopted in Nigeria to correct balance of trade deficit in the economy. The depreciation would normally be expected to bring about a positive change in Nigeria's balance of trade. To Maylene and Agbola (2004), different open economies experience different episodes of exchange rate appreciation in response to different types of shocks, contending that an appreciation in exchange rate induces a contraction of the exporting manufacturing sector. Fluctuations, positive or negative, are not desirable to producers of export products as they increase risk and uncertainty in international transactions which according to Dutta and Ahmed (2006) discourage trade. The instability and continued depreciation of the Naira in the foreign exchange market has resulted in low standard of living, increased cost of production and cost push inflation as well as poor trade balance. Kurihara (2013) stated that exchange rate fluctuation can have negative effect on international trade. Findings by the International Monetary Fund (2000) reveal that these fluctuations induce undesirable macroeconomic phenomena inflation. Viewing the effect of these fluctuations first from its impact on foreign direct investment, devaluation leads to increase in balance of trade. Robinson (2007) found a strong evidence of a weak host country currency increasing foreign direct investment. This is within an imperfect capital market model as depreciation (down change in exchange rate) makes a host country less expensive than export destination countries. Thapa (2002) argued that exchange rate depreciation in host countries tend to increase foreign direct investment inflows; adding that a strong real exchange rate strengthens the incentives of foreign companies to produce at home for export instead of investing in a host country for export. This research intends to provide an empirical basis for the analysis of the effect of price and exchange rate changes on the balance of trade.

Review of Related Literature

According to Obaseki (2001) the exchange rate of a currency measures the worth of a domestic economy in terms of another. The exchange rate measures the external value of a Currency. It provides a direct relationship between the domestic and foreign prices of goods and services. Consequently, the balance of trade is the difference between the monetary value of exports and imports in an economy over a certain period of time. A positive balance of trade is known as a trade surplus and consists of exporting more than is imported while a negative balance of trade is known as a trade deficit or informally, a trade gap (Jhingan, 2007). If the current account is in surplus, the country's net international asset position increases correspondingly. Equally, a deficit decreases the net international asset position.

Theoretical Framework

Financial Asset Theory/Portfolio Balance Approach

Macdonald (1998) stated that the contemporary theory of exchange rate model is geared towards financial assets market. This model tends to adjust exchange rate to equilibrate international trade in financial assets. Economics has it that price is determined by market forces of demand and supply. Kurihara (2013) stated that this explains the shift from equilibrating exchange rate from the price of goods to that of financial assets. Goods prices adjust slowly relative to financial assets prices. There are economic implications as regards the shift from goods market to financial assets prices. As the supply and demand of financial assets in the international financial market change and determine the price of financial assets, exchange rate of different nations change, then the prices of goods in the market automatically follow suit.

Ogundipe (2013) supported that the empirical analysis has shown that there is more variability in the exchange rate than in goods prices showing a better preference of the asset approach. Exchange rate has been discovered to be consistently reacting to the variations in financial assets market while it does not react to changes in goods (Macdonald 1998). Perfect capital mobility is used to designate exchange rate models that equilibrate financial assets market. There is a free flow of capital since the transaction cost is little or less recognized and no restriction to capital control. The implication is that the interest differential is covered or eliminated through the interest rate parity (Oladipupo and Onafaniyohuwo, 2011). As a result of the dynamic nature of the financial market and exchange rate, there will be more volatility. If goods prices adjust relative to financial assets prices, balance of trade may be positively or negatively affected.

Empirical Evidences on Exchange Rate

Thapa (2002) using co integration and error correction models analyzed the impact of real effective exchange rate on economic activities in Nepal to determine which of the transmission channels (aggregate demand channel and aggregate supply channel) the effect of variation in real exchange. The traditional view has it that the real exchange rate operates through the aggregate demand

channel. By this, means that the depreciation of real exchange rate enhances the international competitiveness of domestic goods, boosts net exports and eventually enlarges GDP. The result of the empirical study shows that the traditional view should hold and that real exchange rate should be kept constant. Ho (2004), examined the import demand function of macao by testing two popular models: (i) aggregate and (ii) disaggregate. The Johansen - Juselius co integration tests were employed to find out if the relevant economic variables are co integrated in the long- run. It is observed that co integration relationship exist in both scenarios (constant and trend; and constant) of the disaggregate model. On the whole, from the estimation results it can be concluded that the disaggregate model is more appropriate to explain the import demand. Damonense and Agbola (2000) using VECM estimated the long-run effects of exchange rate devaluation on the trade balance in Ghana. The results provide evidence supporting the view that devaluation of the exchange rate worsens the trade balance in the long-run. Dutta and Ahmed (2006) using co integration and error correction model approaches investigated the behaviours of Indian aggregate import demand during the period 1971 – 1995. The results obtained indicate that import volume is co integrated with relative import price and real GDP. The output of the econometric model estimate shows that import demand in India is largely explained by real GDP and generally less sensitive to import price changes. Salasevicius and Vicious (2003) using the VECM to test for Marshal – Lerner condition in the exchange rate-balance relationship in Latvia. The condition is found to be met while the results concerning some are ambiguous. The analysis reveals that a long-run equilibrium relationship among them exists. The policy implications drawn from this study are therefore significant in view of their contributions to informed decision making in Nigeria and others who share the same economic structure.

Gebeyehu (2010) using co integration investigated exchange rate and trade balance in Ethiopia using the variables trade balance ratio of import to export and real gross domestic price found that real exchange rate can be used to correct trade imbalance. Ogundipe, Ojeaga and Ogundi (2013) in estimating the long run effects of exchange rate devaluation on the trade balance of Nigeria using money supply, interest rate and exchange rate. Johansen co integration and variance position was used for the analysis. The result showed that exchange rates induce an elastic and significant relation on trade balance in the long run. In a related study by David, Umeh and Ameh (2010), they studied the effect of exchange rate fluctuation on the Nigerian manufacturing sector using the variables output, employment rate and foreign private investment. The analysis was done using correlation and the findings revealed that reduction in imports will enhance manufacturing. Similarly, Enekwe and Ordu (2010), examined effect of exchange rate fluctuation on manufacturing sector in Nigeria using multiple regression as a method analysis. The study used manufacturing gross domestic product, foreign private investment and exchange rate as the variables for the study. It concluded that exchange rate have significant effect on manufacturing gross domestic product. Adeniran, Yusuf and Ademeyi (2014), using ordinary least square examined the impact of exchange rate fluctuation on economic growth in Nigeria. The variables used are interest rate, inflation rate, exchange rate and gross domestic product. It was discovered that the higher the interest rate and inflation rate the lower the gross domestic product. In a related study Basirat, Nasirpour and Jorjzadeh (2010) studied the effect of exchange rate fluctuation on economic growth in Iran using the variables inflation, trading volume & production while panel data was used in the analysis. The findings revealed that economic growth is positive when exchange rate and financial development are stable. Oladipupo (2011) examined impact of exchange rate on Balance of payment in Nigeria using ordinary least square regression analysis and discovered that exchange rate has a direct impact on balance of payment of a country. The variables used in the study include, export devaluation and import. Umoru (2013) carried out a study on exchange rate misalignment & balance of payment adjustment in Nigeria. The study considered exchange rate and balance of payment as its variables while co integration was used as the method of analysis. It realized that balance of payment affects exchange rate appreciation. Kandil (2009) studied exchange rate fluctuation and the balance of payment in United States of America using co integration method of analysis. Exchange rate and balance of payment were the variables used for the study. The finding of the study revealed that overvalued exchange rate in balance of payment must be adjusted to return the peg. Kurihara (2013), using ordinary least square examined the effect of exchange rate fluctuation and financial development on international trade in Japan with the variables, balance of trade, financial development and gross domestic product. It was discovered that exchange rate fluctuation may have negative effect on international trade. Consequently, Ogbonna (2011) examined the impact of exchange rate variations on trade balance in Nigeria using unit root test, multivariate co integration and ordinary least square. Exchange rate, balance of trade and balance of payment are the variables used for the study. The findings revealed that trade is improved by devaluation.

2. RESEARCH DESIGN AND METHOD

The research design used is the ex-post facto so as to ensure non-manipulation of the data. To empirically verify the impact of exchange rate variation on Nigeria's balance of trade, Ordinary Least Square, regression method analytical technique was employed following the quantitative nature of the data. Simple regression equation was employed following one dependent and one independent variable. Also, secondary data from Central Bank of Nigeria annual reports and statement of account as well as

statistical bulletins was used. Data required for this research work were obtained from the balance of trade which is the difference between total merchandise exports minus imports presented in millions of naira and the exchange rate expressed in naira in relation to US dollar (i.e. Naira/US dollar exchange rate). However, data sources were secondary from the Central Bank of Nigeria statistical bulletin and federal office of statistics.

Model Specification

Given the theoretical exposition of this study, the exchange rate variation was used as the independent/explanatory variable following the influence it has on balance of trade which is the dependent variable. Data for balance of trade was collected from the total merchandise export minus import and the former (exchange rate) was collected from the Naira/US dollar variations all within the period under consideration. Following Rose (1999), the model was adopted and modified to suit the analysis in the work.

$$BOT = b_0 + b_1 (EXR) + b_2 (IMP) + b_3 (EXP)$$

Where: BOT	=	Balance of trade
b_0	=	Intercept of the equation
b_1	=	Parameter estimate
EXR	=	Exchange rate
IMP	=	Import rate
EXP	=	Export rate

However, to justify the signs and parameter estimate on the explanatory variables in the above, b_0 is constant, b_1 is the slope of the equation. It is expected to be positively signed on the assumption that Naira/US dollar exchange rate will lead to a favourable balance of trade to Nigeria.

3. METHOD OF EVALUATION

To capture the effects of the explained and the explanatory variables, the ordinary least square (OLS) analytical technique was used. Serial Correlation LM test was used to check for higher order error while Ramsey Reset test was used to determine whether the model is correctly specified/fitted or not. Thus, Durbin Watson test was used in finding out the empirical viability of the individual regression coefficient. In addition, coefficient of regression (R^2) and adjusted coefficient of regression (R^{-2}) was tested to know the value of the dependent variable explained by the independent variable.

Serial Correlation LM Test

Unlike the Durbin Watson statistic for AR(1) errors, the LM test may be used to test for higher order ARMA errors and is applicable whether there are lagged dependent variables or not. Consequently, the models are free from autocorrelation. This overrides any possible result of Durbin Watson in testing autocorrelation in any stated model (table 1).

Table 1 Serial Correlation LM Test

Model	F-Statistic	P-value
1	24.59853	0.0000
2	17.74418	0.0000
3	5.672106	0.0103

Source: Computer output data using E-views 8.0

Ramsey RESET Test

The Ramsey RESET test determines whether the model is correctly specified/fitted or not. The rationale behind the test is that if non-linear combinations of the independent variables have any power in explaining the dependent variable, the model is not well specified. The p-values as depicted in Table 2 are significant at 5% level of significance. The alternate hypothesis that the model is well specified is accepted.

Table 2 Ramsey RESET Test

Model	F-Statistic	Df	P-value
1	13.01681	22	0.0016
2	19.35253	22	0.0002

3	3.275081	22	0.0033
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Source: Computer output data using E-views 8.0

OLS Analysis

Exchange Rate and Balance of Trade

The OLS result on the effect of exchange rate on balance of trade is presented in Table 3. The result unveils that exchange rate is not statistically significant at 5% level of significance. The coefficient of the constant 479,374.6 implies that holding exchange rate constant, balance of trade will increase by 479,374.6million. Exchange rate has positive relationship with balance of trade. The exchange rate coefficient of 7,771.690 suggests that a percentage increase in exchange rate resulted in 7,771.690million increase in balance of trade. The coefficient of the Adjusted R-squared in Table 4.3 revealed that only 7.14% of changes in balance of trade was explained by the variation in exchange rate. Thus, 92.86% changes in balance of trade were not explained by variation in exchange rate. The serial correlation LM test result overrides any possible value of Durbin Watson as it is superior to Durbin Watson in testing autocorrelation in any stated model.

Table 3 Ordinary Least Square Regression Result for Model 1 Dependent Variable: Balance of Trade

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	479374.6	538371.3	0.890416	0.3825
EXR	7771.690	4607.022	1.686923	0.1051
R-squared	0.110104	Mean dependent var		1210318.
Adjusted R-squared	0.071413	S.D. dependent var		1657911.
S.E. of regression	1597617.	Akaike info criterion		31.48254
Sum squared resid	5.87E+13	Schwarz criterion		31.58005
Log likelihood	-391.5318	Hannan-Quinn criter.		31.50959
F-statistic	2.845708	Durbin-Watson stat		0.401724
Prob(F-statistic)	0.105136			

Source: Computer output data using E-views 8.0

The granger causality result in Table 4 indicates that variation in exchange rate does not granger cause balance of trade. The p-value of the F-statistic is not significant at 5% level of significance. Invariably, exchange rate has no significant effect on balance of trade in Nigeria.

Table 4 Granger Causality for Exchange Rate and Balance of Trade

Null Hypothesis:	Obs	F-Statistic	Prob.	Remarks
EXR does not Granger Cause BOT	23	0.01478	0.9045	No Causality
BOT does not Granger Cause EXR		0.15294	0.6999	No Causality

Source: Computer analysis using E-views8.0

4. FINDINGS

There is a positive relationship between exchange rate and balance of trade. This result supports the work of Basirat, Nasirpour and Jorjorzadeh (2010) that exchange rate has positive relationship with balance of trade. The positive relationship between exchange rate and import disagrees with the findings of David, Umeh & Ameh (2010) that exchange rate has significantly negative relationship with imports.

Recommendations

The government should encourage policies that will boost export and enhance the export of primary products so as to attract foreign exchange inflows and foreign investment. The economy should be geared towards production of multi-sectoral tradable goods for foreign exchange. There should be reduction in the issuance of foreign currency for importation of certain items, since increase in imports leads to increase in demand for the foreign currency of the exporting country.

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